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VR as a Preservation and Simulation Tool for Media Art Installations

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Abstract

David Hall (1937-2014) was one of the pioneers of video art in the UK, beginning with *TV Interruptions* that he made for STV in 1971 as part of the Edinburgh Art Festival. He continued to make single screen video works, but his main focus was the creation of video sculptures. Most of these sculptures used old cathode ray tube monitors. Although these are still available and working at the moment, over time it will become more and more difficult to find any working examples. Due to these problems with technological obsolescence, many of Hall's and numerous other artists works may not be so easily replicated in the future. With this in mind, other ways to present these works need to be considered to allow them to be appreciated by future audiences. One way to do this is by using virtual reality. This paper summarises the recreation of two David Hall video installations in VR. Viewers experienced the work by being immersed in a 3D virtual gallery. This gave the viewer an idea what the work would be like in real life. The process of creation, maintaining the integrity of the work, authenticity and the user experience will be examined.

Keywords

Video, art, electronic, virtual reality, VR, obsolescence, immersive, media, installation, sculpture

Introduction

Media Art and the problems of technological obsolescence and deterioration is well known, particularly those artworks which rely on the failings or quirks of the technology to achieve their aim. [1] Although many artists using analogue video had been careful to keep their original tapes, less attention was paid to keeping the equipment needed to display these works in an exhibition context [2]. This was perhaps due to the cost of the equipment for most artists and the expectation that the equipment would always be available. Artists such as Naim June Paik tried to keep his apparatus in most cases, but it has still suffered problems of deterioration, such as in his *The More The Better* (1988) installation at the National Museum of Modern and Contemporary Art in Gwacheon, South Korea. [3] There have been many documented projects to digitise and archive artists video tapes from obsolete formats, such as the REWIND project in the UK, but less so the equipment, which has become the reserve of the larger institutions and niche organisations in the museum and media art research sector.

Cathode Ray Tube Monitors

The most ubiquitous piece of apparatus used in early video art is the CRT (Cathode Ray Tube) monitor. Although many of these are still around and working today, they are no longer generally manufactured. The death knell was when Sony announced in 2008 that they would cease production of their sought-after Trinitron monitor and eventually those still in existence will stop working when the tube fails. [4] Although many vintage video artworks will work on modern flat screen displays or projected, there are various reasons why this might not be desirable. Firstly, the artwork may be sculptural, where the monitor itself is part of the work, and this may even relate to what is being displayed on the screen. Secondly, the quirks or idiosyncrasies of the CRT monitor may also be part of the work e.g. Paik's *Magnet TV* (1965) where an industrial magnet distorts the image on the TV, which wouldn't be possible on a modern display. Thirdly, most early video works were produced for 4:3 ratio monitors and it is difficult to find modern flat screens that are not 16:9 ratio, especially larger ones. This is particularly important when re exhibiting pieces created for video walls, which became increasingly popular in the 1980-90s, when video channel synching technology became available. Finally, the images that CRT monitors display have a certain aesthetic that may be important to the artwork. Older work can look 'better' on CRTs due to the correct display of interlaced work and the perceived reduction of video noise.

Virtual Reality

What happens then in the future if an artist, collector or gallery wishes to re-exhibit an artwork where the original equipment has not been collected or the equipment required is entirely obsolete and unavailable? One possible solution is to use Virtual Reality (VR). The widely used preservation model of either migration, emulation or reinterpretation can perhaps be used here, and would involve aspects of all three. [5] However, I suggest that a re-created piece in VR should be referred to as a simulation or an illustration rather than a version of the work itself. That way, any arguments about the lack of complete authenticity can be avoided.

The first time the author used VR was in 1991. At that time the technology wasn't advanced enough to use for this

purpose in any worthwhile way – the headsets were bulky and heavy, the latency of the display was high, which meant you had to move slowly, and the graphics required a low polygon count which resulted in a lack of resolution. The substantial cost of the technology meant that the main applications were restricted to arcade gaming, military and aerospace uses. [6]

It has now come to the point where substantial advancements in VR technology and computer speed have meant that VR can be used for considerably more applications in a useful way. The introduction of equipment from companies, which include HTC and Oculus, have made the technology much more affordable and accessible along with 'game engine' software such as Unity and Unreal. The fact that these are called 'game engines' highlights that this technology is still being driven by the gaming industry, but it is being adapted for use in many other areas.

Due to these advances in technology, the author decided to engage in some experimentation using VR to re-create media artworks susceptible to obsolescence. Duncan of Jordanstone College of Art & Design (DJCAD) at the University of Dundee already had a well-established 3D lab, and also the author was engaged in the preservation of media art through the REWIND research project and its associated projects. This resulted in two experiments featuring the work of pioneering UK video artist David Hall (1937-2014). The reason Hall was selected was due to his sculptural use of the CRT and that the author had worked with him previously on re-staging a number of his artworks, so there was a tacit understating of Hall's rational and philosophy. A summary of these two case studies now follow, which were permitted by David Hall's estate.

A Situation Envisaged: The Rite II (Cultural Eclipse)

This piece by Hall was first created in 1988-90, it consists of 15 CRT monitors built as a videowall 4 high by 3 across close to a white wall. All but one face the wall and are not seen. Pre-recorded TV broadcasts reflecting on the wall form an aurora of changing light. In the centre, on the only screen to be seen, is an image of the moon recorded using equipment similar to that used by John Logie Baird in the 1920s. The sound, by David Cunningham, is derived from multiple broadcast channels and composed as a musical score, which is heard coming from within the videowall. This piece was chosen as being a good test to ascertain how well this could be replicated due to the range of different videos playing on multiple CRTs and the reflection of these videos on the wall (Fig 1).

The VR model was created in 2017 with Rhoda Ellis who was a recent undergraduate in Art & Philosophy at DJCAD, who for her degree show had re-created sculptures in immersive VR. Before he passed away Hall had written reasonably detailed plans of a number of his installation works which he had editioned with his gallery, Richard Saltoun. These were used as the basis for the simulation, and as it is virtual, all of his 'ideals' could be accommodated without

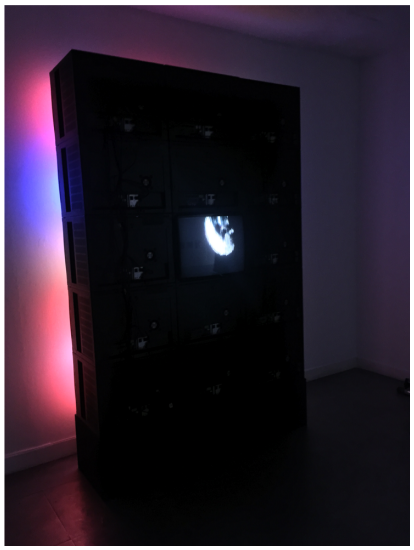

Figure 1. *A Situation Envisaged: The Rite II (Cultural Eclipse),* 1988-90 on display at Richard Saltoun Gallery, London, 2015 ©Adam Lockhart & Debi Hall.

the restrictions on equipment availability or compromised by the size and shape of the gallery. In fact, theoretically, one could choose to have the piece shown in a virtual version of any gallery in the world. The monitors which Hall specified were 26" minimum cube videowall monitors. It was decided to base the model on the Hantarex EQ/3 and the use of these would then determine the size of the gallery. Part of Ellis's process during her previous work was to scan sculptures using photogrammetry and laser scanning techniques, which would lead to the creation of the 3D models. This was attempted with an actual Hantarex monitor, but due to reflections on the glass and the lack of features on the black casing, this approach was problematic and subsequently abandoned. The monitors were then created directly in the VR game engine software, Epic Games' Unreal Engine, as boxes with the screen side curved and a photographic image of the rear of a monitor on the back. This software was also used to create the whole scene. Once the videowall was modelled, the gallery was built around this to an appropriate size, with the monitors near the back wall of the gallery. The original multichannel videos for the piece were already available in the REWIND archive and these were embedded on each of the monitors according to Hall's specifications. They were also 'projected' onto the back wall as a virtual light to create the reflective aurora (Fig 2). The sound for the piece was directionally located inside the videowall, as it would have been in the original piece, rather than just being heard as general ambient sound. A door was added on the opposite wall from the installation, with a lit-up information panel on the side wall to further create the feel of a gallery. Although it is possible for this model to be viewed and accessed via a 2D computer screen, the idea was that this should be a fully immersive piece to allow the experience to be as authentic as possible. In order to do this an HTC Vive headset was used with stereo sound, along with

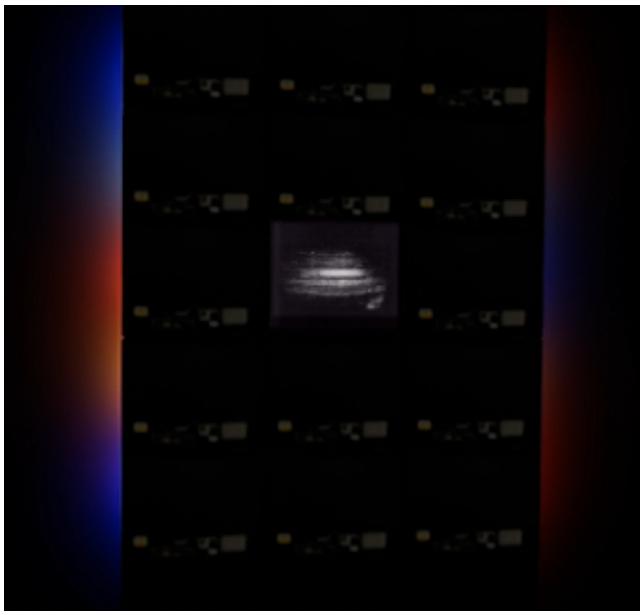

Figure 2. *A Situation Envisaged: The Rite II (Cultural Eclipse), 1988-90* VR simulation. ©Rhoda Ellis & Debi Hall.

motion sensor lighthouses which allow the headset's position to be detected in space.

The results from simulation were showcased at the NEoN Digital Arts Festival in Dundee, Scotland in 2017. This was located in a large disused factory building, so there were no issues of restrictive space. The virtual walls of the gallery were mapped onto the floor with tape, so that the 'arena' was the same size. This gave a good opportunity to discover reactions from members of the public, which yielded some unexpected results. Once the user entered the virtual gallery, by putting on the headset, they were located near the door end of the model, which would allow them to walk towards the installation. For many people, it was still the first time they had used immersive room scale VR so the novelty and amazement of the experience was more of interest to them than looking at the artwork itself. Another issue was that people who were not familiar with this particular piece couldn't quite work out what they were viewing, in respect to the virtual apparatus. This then had to be explained, which would have been unnecessary in the real-life installation. Therefore, three levels of explanation were required – the practicalities of the VR, what they were looking at in the virtual space and the interpretation of the work itself. Only the last of these would be required in the physical world. Those who were already familiar with the piece reacted quite positively and found that they were unintentionally able to see more of the piece than in the real world due to the lack of physical walls i.e. one could put one's head outside the virtual walls and look back in. This then revealed more clearly the content of the videos on the monitors which were not meant to be seen this way, but were there to provide the reflective aurora on the wall.

TV Interruptions (7 TV Pieces): The Installation

After the outcomes of the first experiment, it was decided to focus on a more accessible piece for the viewer to experience. In this case it was decided to model Hall's *TV Interruptions (7 TV Pieces): The Installation.* This piece was originally made for Scottish Television in 1971, as seven different short abstract interruptions to be broadcast unannounced throughout the duration of the Edinburgh Festival in the same year. This piece was then turned into an installation in 2006 in conjunction with the author as part of the REWIND project. The installation consists of 7 CRT monitors on plinths, placed in a cluster and facing in different directions. All of the monitors play out the full 7 TV pieces, but in a different order, so that the same one is not on at the same time. Again, instructions on the preferred type and size of monitor, in this case a Hantarex EQ/3, 25", and the distance apart of the monitors were stipulated by Hall in his specification.

For this experiment, the author partnered with a 3D animation specialist, Sang-Hun Yu, who is a colleague at DJCAD and a PhD student investigating the use of 3D modelling for forensic purposes. In this case, Yu used his skills as a 3D modeler to create the CRT monitors from specifications from The Block, a specialist monitor rental company and measurements from an actual Hantarex monitor. [7] This was carried out using Maya software and included such things as sockets and cables emerging from the rear of the monitor and proper textures added to the surfaces, all adding to the authenticity (Fig 3). Unity was used as the game engine to build the VR model in which Yu was more proficient, so this also provided an alternative to Unreal for a

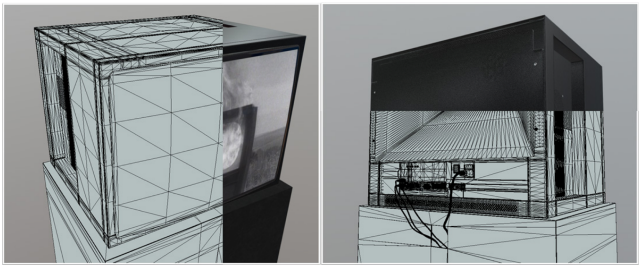

Figure 3. *TV Interruptions (7 TV Pieces): The Installation,* 1971/2006, VR simulation Monitor 3D Model. ©University of Dundee & Debi Hall.

comparison. The model from Maya was imported into Unity, replicated and placed on plinths into a gallery space built to fit with Hall's specification. The videos were then inserted into all 7 of the monitors, with the sound from each directionally coming from each monitor (Fig 4).

This simulation was exhibited at the Besides the Screen Conference, Kings College, London in July 2018. The HTC Vive headset and equipment were used again for this. The reaction from the users was much more positive in this case, in that it was more obvious what was being displayed, so the

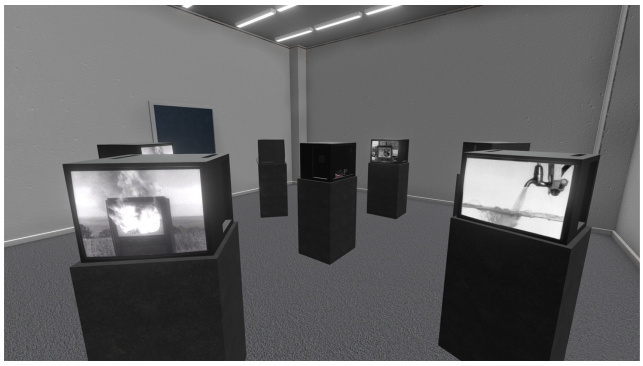

Figure 4. *TV Interruptions (7 TV Pieces): The Installation*, 1971/2006, VR simulation. ©University of Dundee & Debi Hall.

second explanation from the last experiment was not required. It was also more lifelike due to the superior 3D models and the videos played back well without any stuttering. The room in which the work was exhibited, was smaller than the virtual gallery, so care had to be taken to ensure the user didn't walk into the real walls. Interestingly the viewers tended to still walk around all the monitors on plinths even though they could actually walk straight through them.

An odd experience for some people in both of these examples was the lack of a virtual body and particularly their arms. The HTC Vive comes with handsets, but these were not required, as there was no interactivity in the scenes. Others were affected by mild virtual reality sickness, a form of motion sickness, but the time spent in the virtual space in these cases was short enough that this was not a significant problem. [8]

Conclusion

Overall these experiments were valuable but unexpectedly the main focus ended up being the experience of the viewer. Once immersive VR becomes more normalised in society, the novelty of the experience should dissipate enough to allow a more formalised study of the audience reaction. There is also the issue of preserving the VR simulations, which may become obsolete before the original artwork does, akin to the BBC Domesday project of 1986. [9] Tate are in the process of conducting a research project in the preservation of immersive media with results to be published in 2020. [10] The author intends to continue research in this area exploring further the capabilities of VR and augmented reality as the technology improves.

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Author Biography

Adam Lockhart is Media Archivist & Researcher at Duncan of Jordanstone College of Art & Design (University of Dundee). He is a leading specialist in the conservation, preservation and restoration of artists' video. Lockhart has worked on various research projects including REWIND| Artists' Video in the 70s & 80s, Narrative Exploration in Expanded Cinema with Central St Martins College of Art & Design, REWIND Italia and European Women's Video Art. He has acted as curator, co-curator and consultant for many screenings and exhibitions at organisations such as Tate Modern, Tate Britain, BFI Southbank, Dundee Contemporary Arts, Scottish National Galleries of Modern Art, Stills Edinburgh, Streetlevel Photoworks Glasgow, DOCVA in Milan and Shanghai Minsheng Art Musuem.